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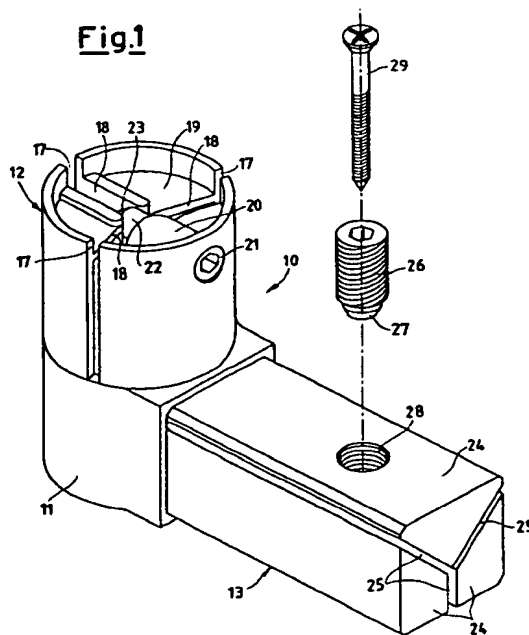
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**(54) Improved coupling for forming loadbearing systems for work stations**

(57) A coupling for forming load-bearing systems for work stations comprises an expandable connector (12) insertable into the hollow top of a table leg (14). Said connector (12) extends from a central body (11) from which there also extends at least one second expandable connector (13) on which there can be mounted the end of a section bar (15) for supporting and fixing a worktop (16). In this manner work stations can be formed having a very solid load-bearing structure which can have the widest possible diversity of attractive configurations, both simple and complex.

**Fig.1**



**EP 0 847 715 A1**

## Description

## drawings:

This invention relates to an improved coupling for forming load-bearing systems for work stations, particularly but not exclusively for offices.

As is well known to the expert of the art, in forming load-bearing structures for work stations intended for offices, in addition to respecting current regulations the following requirements should also be satisfied.

Firstly, it is highly desirable to provide a coupling by means of which work stations can be obtained having the most diverse configurations, arrangements and outer appearance, based on the actual requirements and wishes of the user and the environment in which the work station is to be located.

It is also desirable to provide a load-bearing structure for desks which, besides being of relatively low cost, possesses maximum operational flexibility in terms of achievable arrangements without any technical limit being placed on shapes and dimensions.

This greatly facilitates the design of work stations by the manufacturer and enables the financial investment in the plant required for manufacturing such load-bearing structures to be kept at a low level.

It would also be advantageous for firms not specialized in office furniture manufacture to be able to propose work stations adequate for current requirements on request.

The resultant structure should remain as solid as possible with time, without risk of deterioration due to the materials used.

It is also important for the structure supporting the worktop to be itself self-supporting, without the worktop contributing to system rigidity.

The work station should be able to be formed without having to use special tools, and be adjustable in terms of layout at any moment by adding or removing components or changing the component combination.

The structures achieved should be able to be dismantled and separated into their individual components in the absence of welds, and be able to be rebuilt into different arrangements or recycled as raw material.

The load-bearing structure forming the work station should also be able to easily receive, at various points, service cable housing systems, partitioning systems (panels) and auxiliary worktops, if necessary of different height from the main worktop.

The general object of the present invention is to propose a coupling for forming load-bearing systems for work stations which adequately satisfies the aforementioned requirements.

Said object is attained by a coupling having the characteristics defined in the accompanying claims.

The structural and operational characteristics of the invention and its advantages over the known art will be more apparent from an examination of the description thereof given hereinafter with reference to the accompanying drawings showing embodiments thereof. On the

Figure 1 is a perspective view, with parts shown exploded, illustrating a first embodiment of a coupling according to the invention;

Figure 2 is a perspective view, with parts shown exploded, illustrating the coupling of Figure 1 used for connecting together a table leg and a section bar for supporting and fixing a worktop;

Figure 3 is a perspective view similar to Figure 2, but showing the table leg, the support and fixing bar and the worktop connected together;

Figure 4 is a section on the line IV-IV of Figure 3 showing the operation involved in expanding the cylindrical coupling socket on which the table leg has been mounted;

Figure 5 is a section on the line V-V of Figure 3 showing the expansion stage of the coupling parallelepiped connector on which the support and fixing bar for the worktop has been mounted;

Figure 6 is a perspective view, with parts shown exploded, illustrating a second embodiment of a coupling according to the invention;

Figure 7 is a perspective view, with parts shown exploded, illustrating the coupling of Figure 6 used for connecting together a table leg and two section bars for supporting and fixing a worktop;

Figure 8 is a perspective view, similar to Figure 7, but showing the table leg, the support and fixing bars and the worktop connected together;

Figure 9 is a perspective view showing a third embodiment of a coupling according to the invention, in which the angular positions of the section bar fixing connectors are adjustable;

Figure 10 is a perspective view, with parts shown exploded, illustrating the coupling of Figure 9 used for connecting together a table leg and two section bars for supporting and fixing a worktop, to form different contained angles;

Figure 11 is a perspective view similar to Figure 10, but showing the table leg, the support and fixing bars and the worktop connected together;

Figure 12 is a perspective view showing a possible embodiment of a connection node at which several section bars for supporting and fixing a worktop converge;

Figure 13 is a perspective view, with parts shown exploded, illustrating the connection node of Figure 12 to which three section bars can be fixed;

Figure 14 is a perspective view of the nodes of Figures 12, 13 to which said section bars have been fixed by expanding the shanks;

Figures 15-18 show four possible embodiments of connection nodes;

Figure 19 is a perspective view showing a further possible embodiment of a connection node in which the angular positions of the section bar fixing connectors are adjustable;

Figure 20 is a perspective view, with parts shown exploded, illustrating the connection node of Figure 19 to which three section bars can be fixed; and

Figure 21 is a perspective view of the connection node of Figure 20 to which said section bars have been fixed.

With reference to Figures 1-5 of the drawings, a first embodiment of a coupling according to the invention is indicated overall by 10 and is structurally in the form of a central body 11 from which there extend, at 90°, two elastically expandable connectors 12, 13 intended for securely fixing a table leg 14 and, respectively, a section bar 15 for supporting and fixing a worktop 16 (Figure 2). The connector 12 comprises an expandable body of cylindrical socket shape comprising a plurality of slits 17 along generating lines of the skirt (three in number in the illustrated example), which extend into respective radial slits 18 provided in that endpiece 19 of said cylindrical socket distant from the central body 11.

In the illustrated example, the slits 17, 18 are suitably spaced apart, their purpose being to make the connector 12 relatively elastically yieldable.

In the endpiece 19, there is radially provided between two successive slits 18 an internally threaded tubular seat 20 into which there is screwed a polygonally headed setscrew 21, which terminates with an expansion point 22 having a lead-in taper 23.

A connector 12 of this type is described for example in EP-0467460, to which reference should be made if further clarification is required.

As stated, from the central body 11, at 90° to the cylindrical first connector 12, according to the invention there extends a second connector 13 consisting of an expandable body of generally parallelepiped form.

Said body 13 consists of a plurality of prismatic sectors 24 (three in number in the illustrated example) defined by three slits 25 converging substantially towards the axis of symmetry of the parallelepiped body.

The three prismatic sectors 24 are therefore relatively yieldable elastically and, similar to the connector 12, are expandable by means of a setscrew 26 with a polygonal head and tapering expansion point 27, which is screwed into a threaded hole 28 in one of the prismatic sectors 24 of the connector 13.

The setscrew 26 is bored axially to enable a screw 29 to pass for fixing the worktop 16.

The method of using the coupling 10 of the invention is apparent from the foregoing description with reference to Figures 1-5 of the drawings, and briefly is as follows.

While the connectors 12, 13 are in their withdrawn (unexpanded) rest position, a leg 14 and a section bar 15 are mounted on the connectors 12, 13 respectively.

As can be clearly seen from Figures 2, 3 of the drawings, the leg 14 and the section bar 15 comprise respective apertures 30, 31 through which, by means of a polygonal key 32 (Figures 4, 5), the setscrews 21, 26

can be screwed into their respective threaded seats 20, 28, to cause the connectors 12, 13 to expand in all directions as shown by the arrows 33, 34 (Figures 4, 5).

Consequently, the connectors 12, 13 securely lock in position the leg 14 and the section bar 15, on which the worktop 16 can be fixed.

Figures 6-8 show a further possible embodiment of the invention in which two connectors 13 are combined with the connector 12, all arranged rigidly at 90° to each other.

Figures 9-11 show a third possible embodiment of a coupling according to the invention in which with the connector 12 there are combined two connectors 13 the angular positions of which can be adjusted one relative to the other.

For this purpose, from the central body 11 there extends a flange 35 on which, in the desired angular position, there are fixed a pair of counter-flanges 36 extending rigidly from one end of the respective connectors 13. This fixing is achieved by a bolt 37 passing through holes 38, 39 in the flanges 36, 35. Said bolt 37 is bored axially for the passage of a screw 40 used for fixing the worktop 16.

Figures 12-21 illustrate various embodiments of connection nodes into which a number of section bars 15 for supporting and fixing a worktop 16 converge.

As can be clearly seen from Figures 12-18, a connection node can comprise a central body 41 from which there radially extend a plurality (for example 2, 3 or 4) of expandable connectors 13 arranged in fixed angular positions.

In contrast, Figures 19-21 show a connection node in which three connectors 13 can be mutually arranged in variable angular positions by using the system comprising a flange 35 and counter-flanges 36 previously described with reference to Figures 9-11 of the drawings.

The objects stated in the introduction to the description are hence attained, in particular that of being able to form work stations having a very solid load-bearing structure which satisfies current regulations and can have the widest possible diversity of configurations, both simple and complex.

This is achieved by virtue of the fact that the coupling of the invention is an independent component, separate both from the table leg and from the section bar for fixing the worktop.

In addition, when mounted, the coupling of the invention is completely hidden from view so that it does not negatively influence the appearance of the completed work station in any way. The section bars 15 can be supplied in the various commercially available lengths and cut by the work station manufacturer according to requirements.

Said section bars 15 can be used both for supporting service cables and for fixing partitioning panels and other accessories provided for the worktop.

## Claims

1. A coupling for forming load-bearing systems for work stations, of the type comprising an expandable connector (12) insertable into the hollow top of a table leg (14), characterised in that said connector (12) extends from a central body (11) from which there also extends at least one second, expandable connector (13) on which there can be mounted the end of a section bar (15) for supporting and fixing a worktop (16). 5 10
2. A coupling as claimed in claim 1, characterised in that said expandable connector (13) is substantially parallelepiped and consists of a plurality of prismatic sectors (24) defined by slits (25) converging substantially towards the axis of symmetry of the connector (13). 15
3. A coupling as claimed in claim 2, characterised in that said sectors (24) are expandable by a setscrew (26) which is screwed into a threaded hole (28) provided in one of said sectors (24), and can be manipulated from the outside of said section bar (15). 20 25
4. A coupling as claimed in claim 1, characterised in that the connectors (12, 13) form a contained angle of 90°. 30
5. A coupling as claimed in claim 1, characterised by comprising two connectors (13) forming contained angles of 90° with each other and with the connector (12). 35
6. A coupling as claimed in claim 1, characterised in that said connectors (13) are two in number and are of angularly adjustable position. 40
7. A coupling as claimed in claim 6, characterised in that said connectors (13) are fixed, by means of counter-flanges (36), onto a flange (35) extending from a body (11) carrying the connector (12). 45
8. A coupling as claimed in claim 1, characterised by comprising, in combination, a connection node into which several section bars (15) for supporting and fixing the worktop (16) converge, said node consisting of a central body (41) from which a plurality of said connectors (13) extend. 50
9. A coupling as claimed in claim 8, characterised in that the connectors (13) of said plurality are of angularly adjustable position. 55

Fig.1

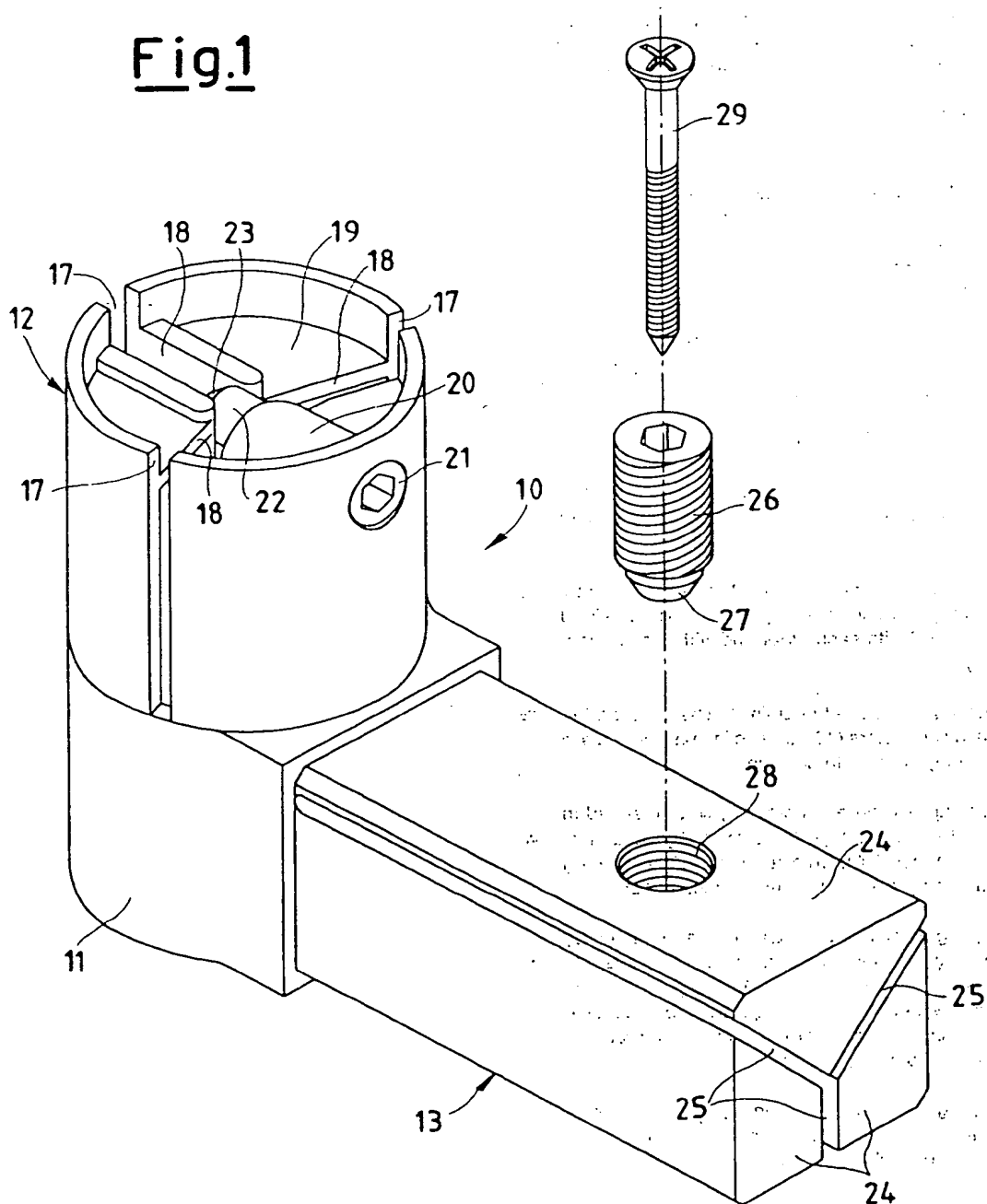


Fig.2

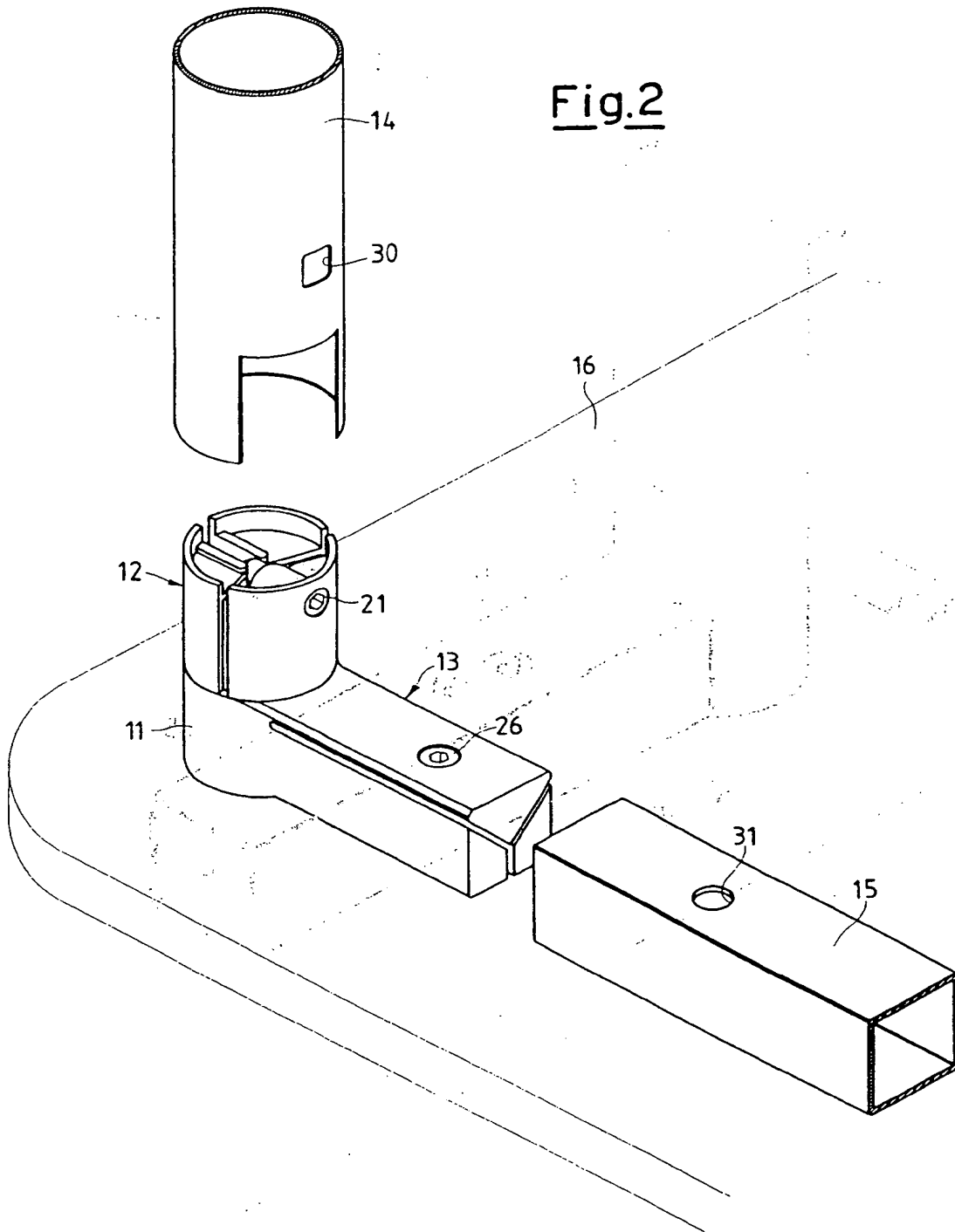
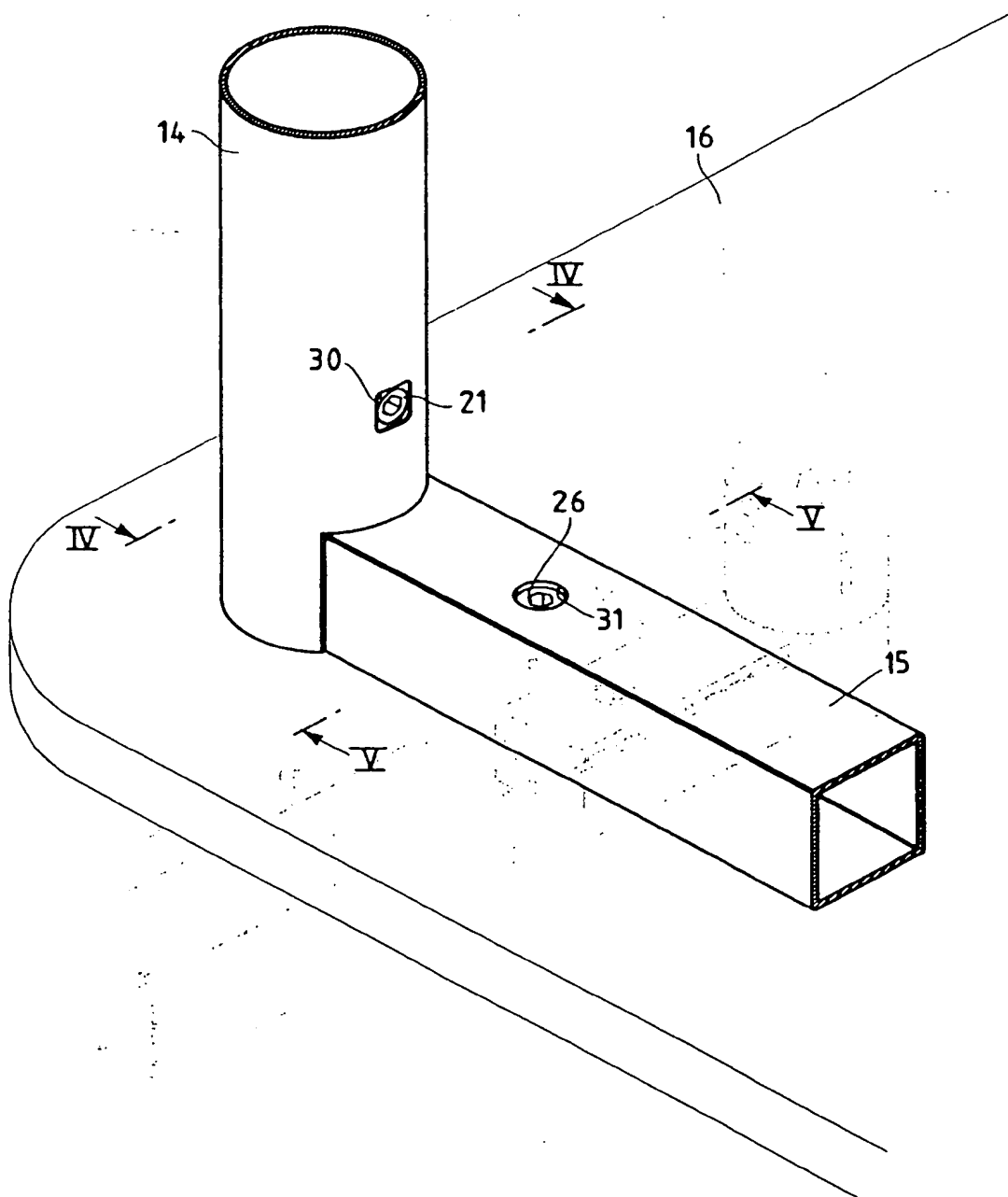


Fig.3



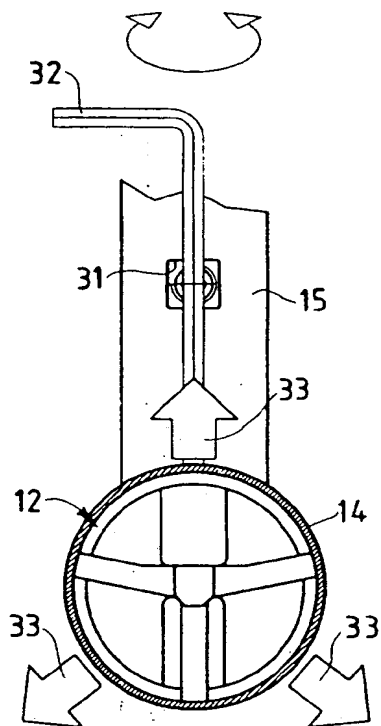


Fig.4

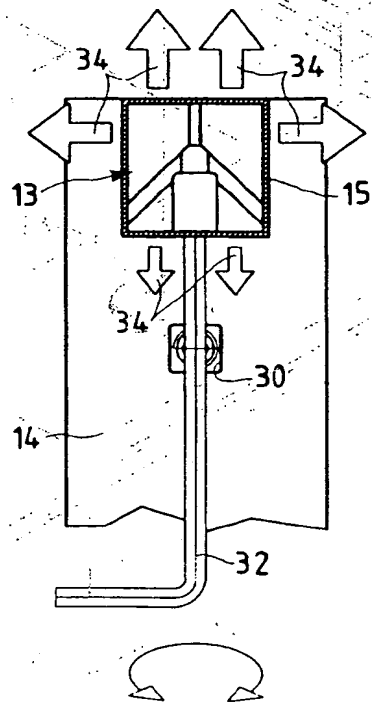


Fig.5

Fig.6

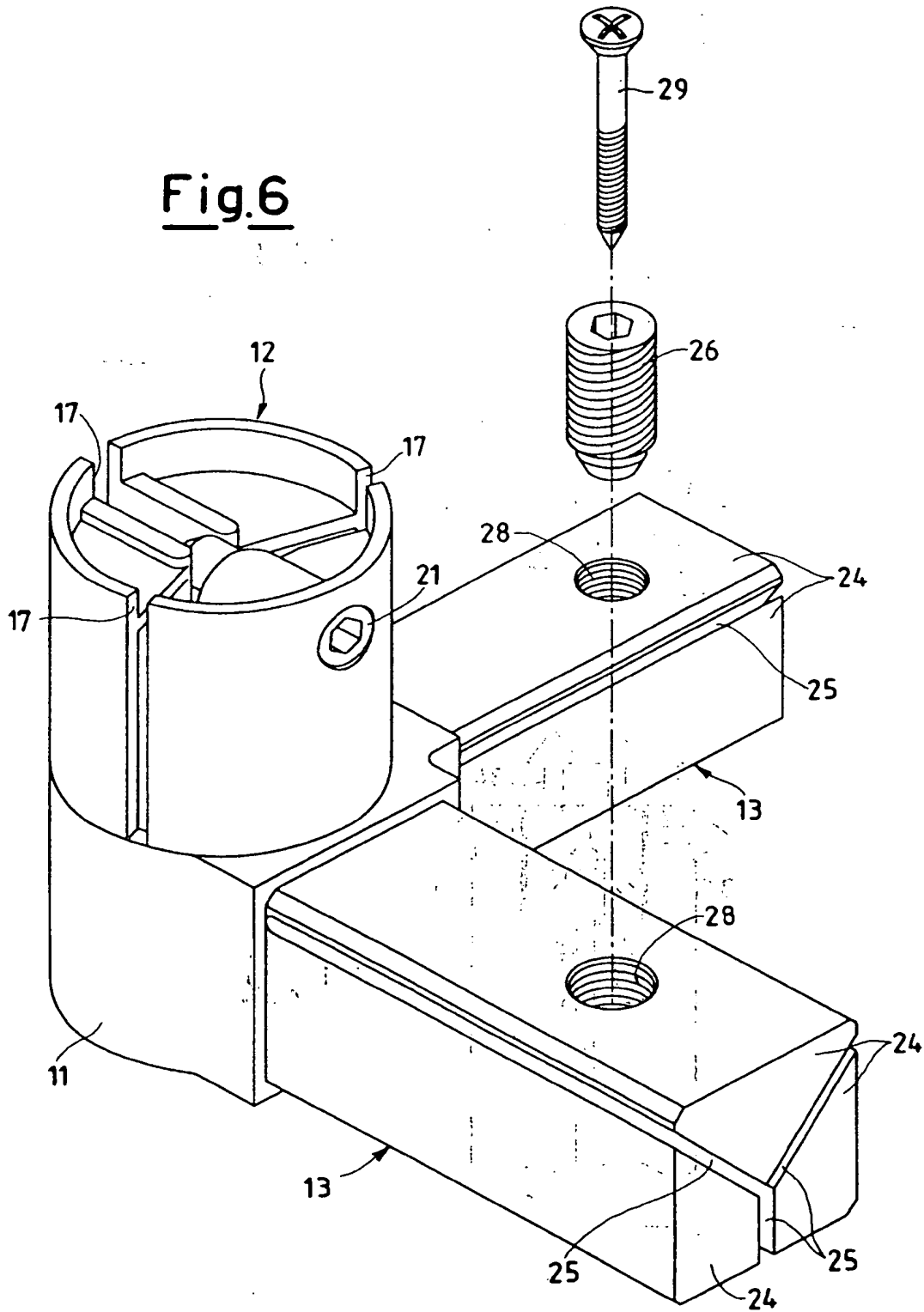


Fig.7

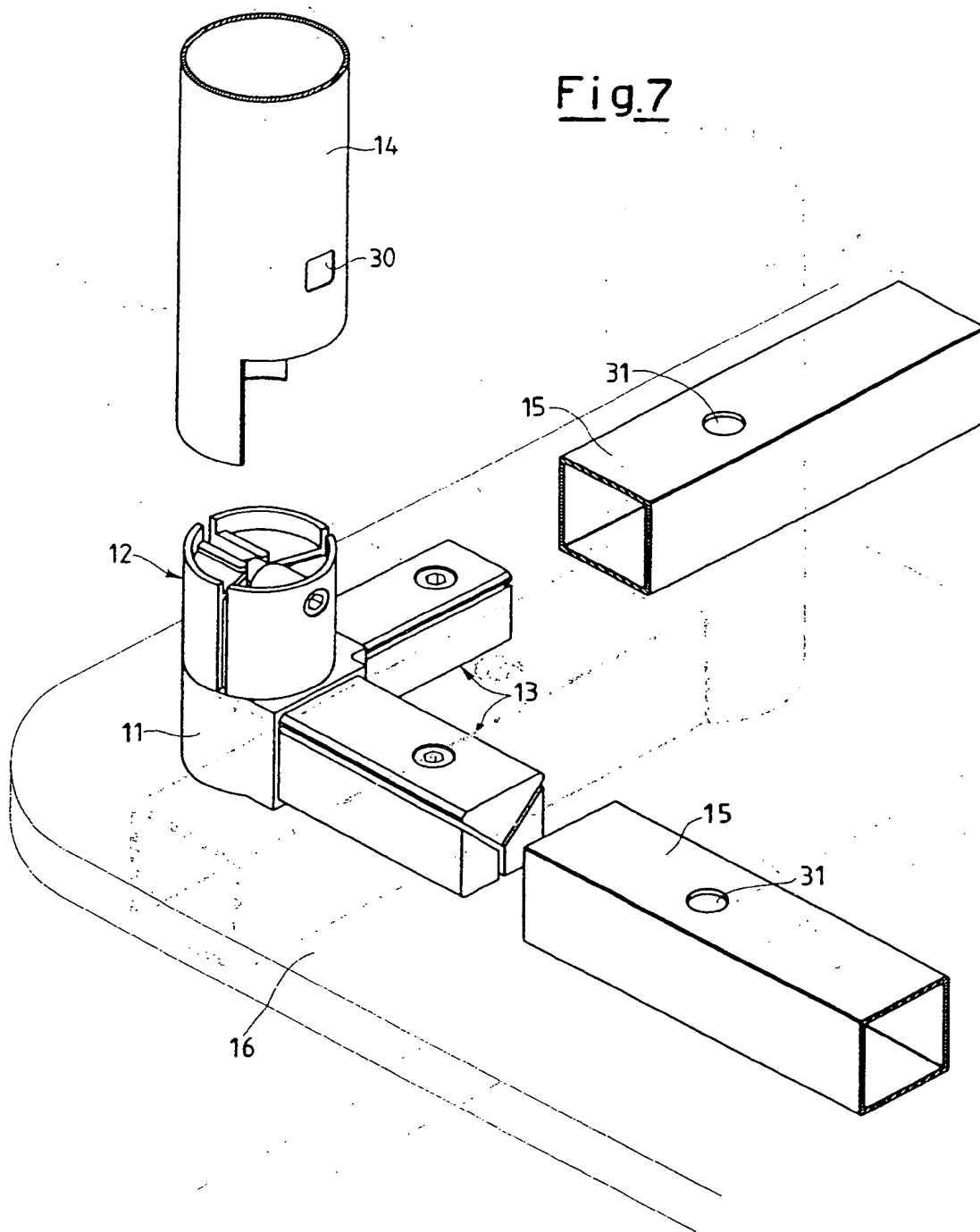


Fig.8

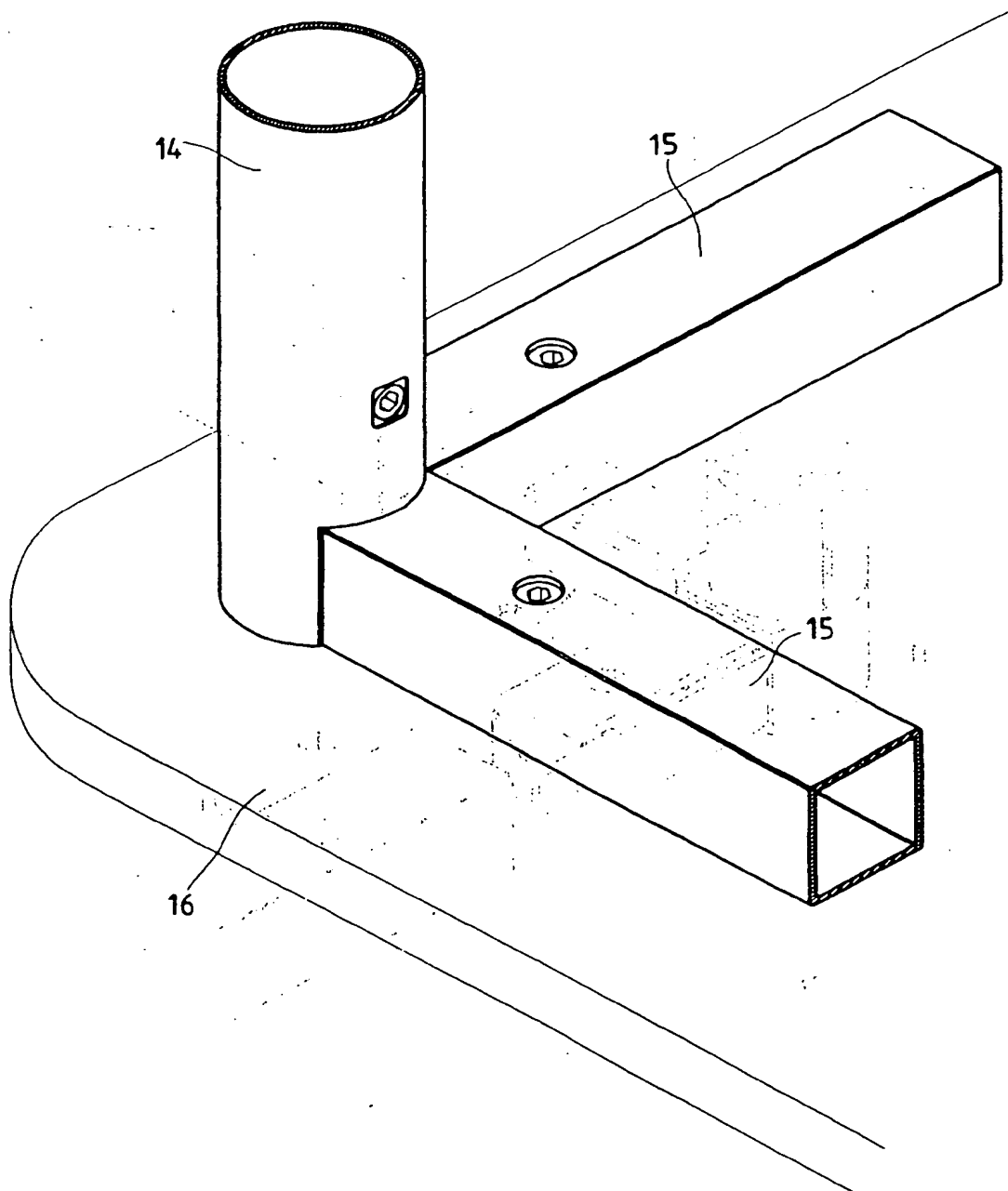


Fig.9

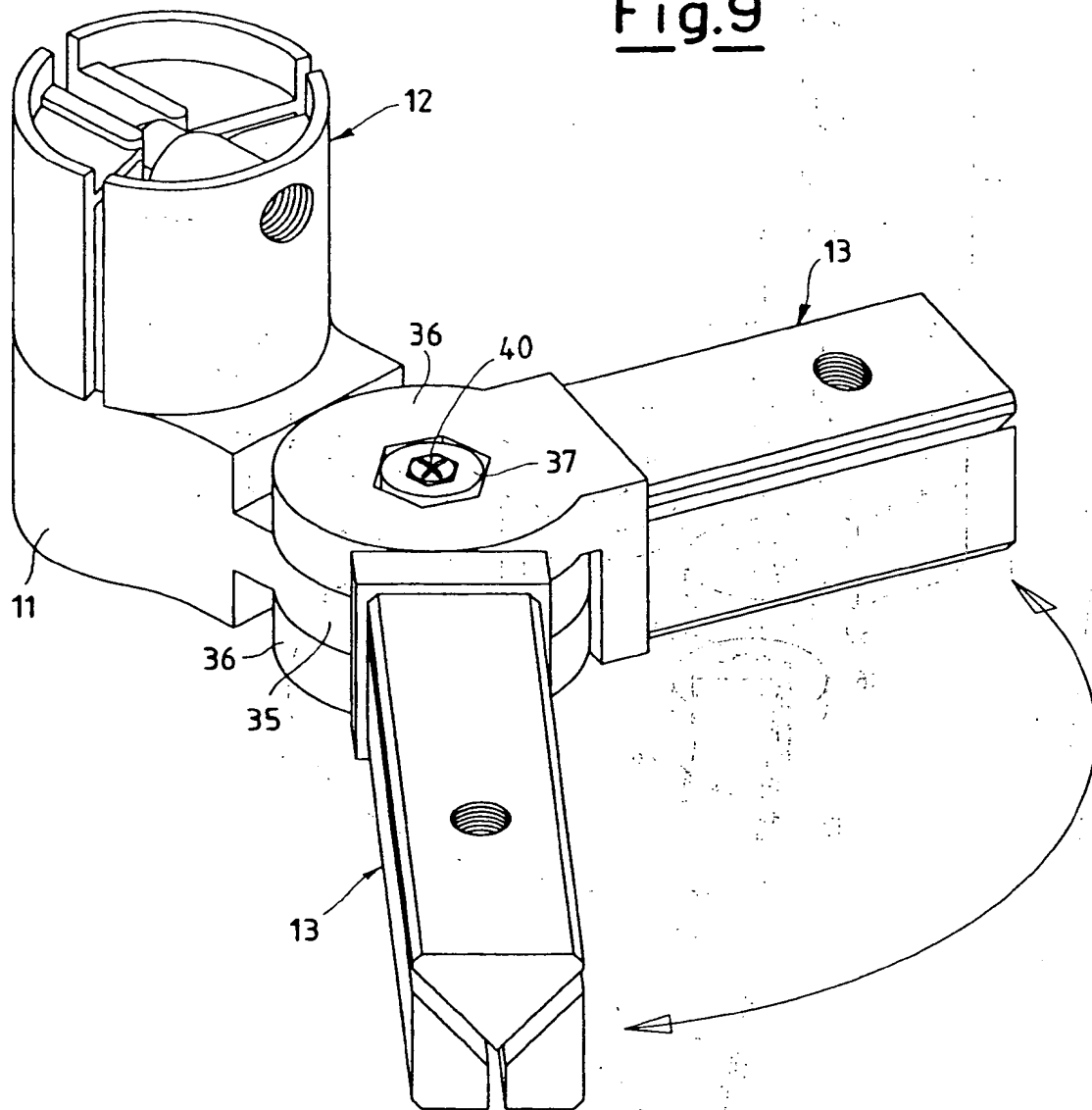


Fig.10

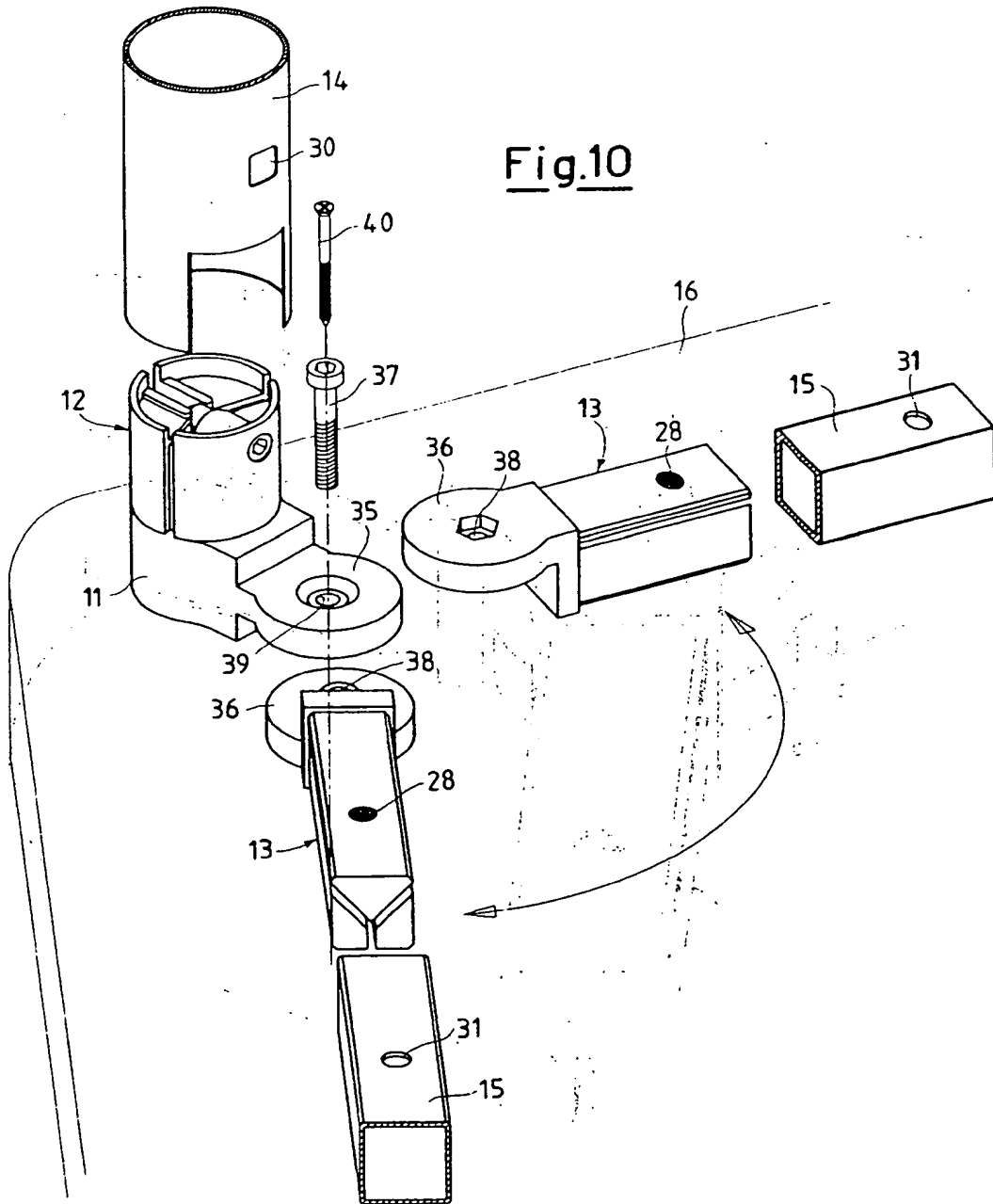


Fig.11

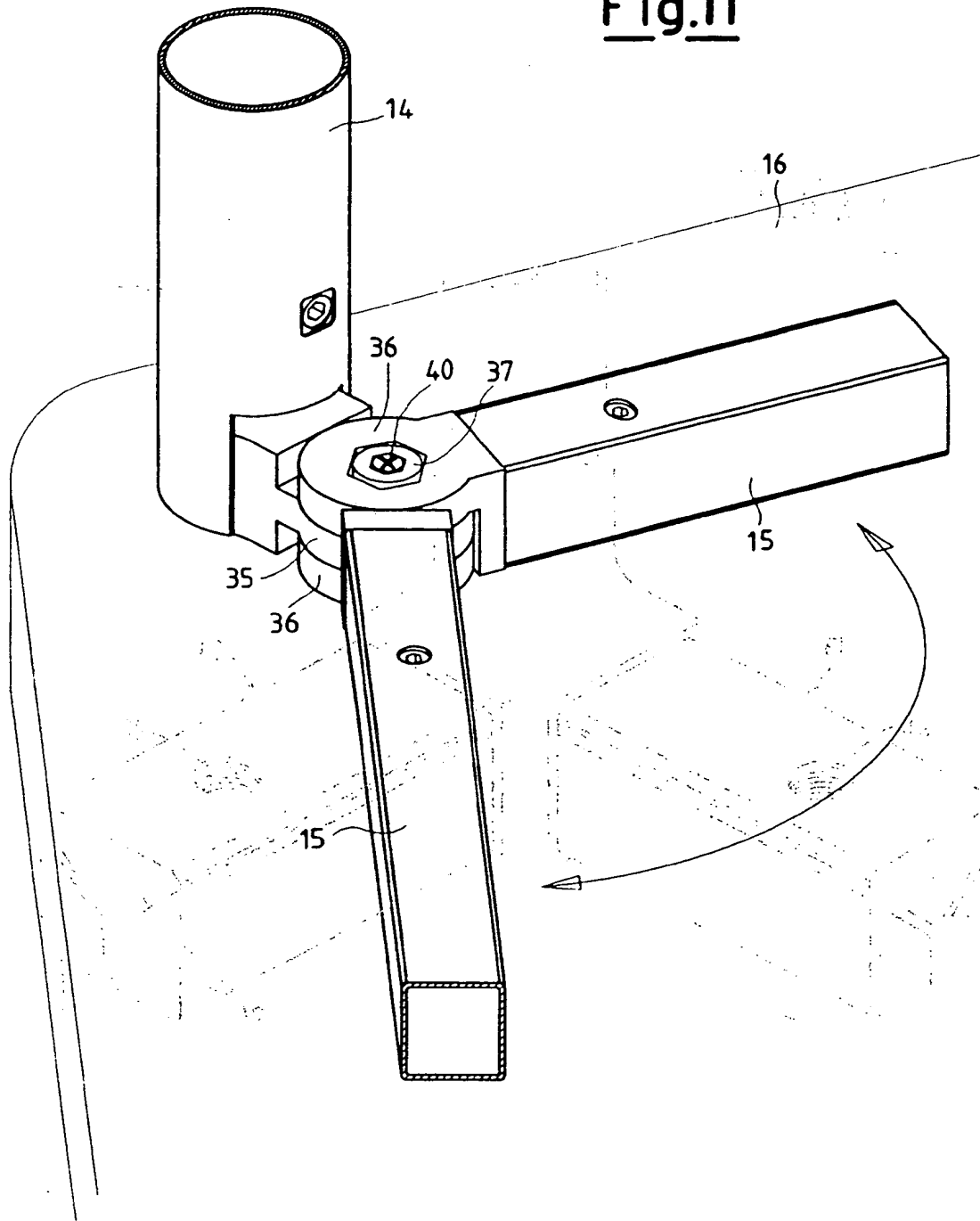
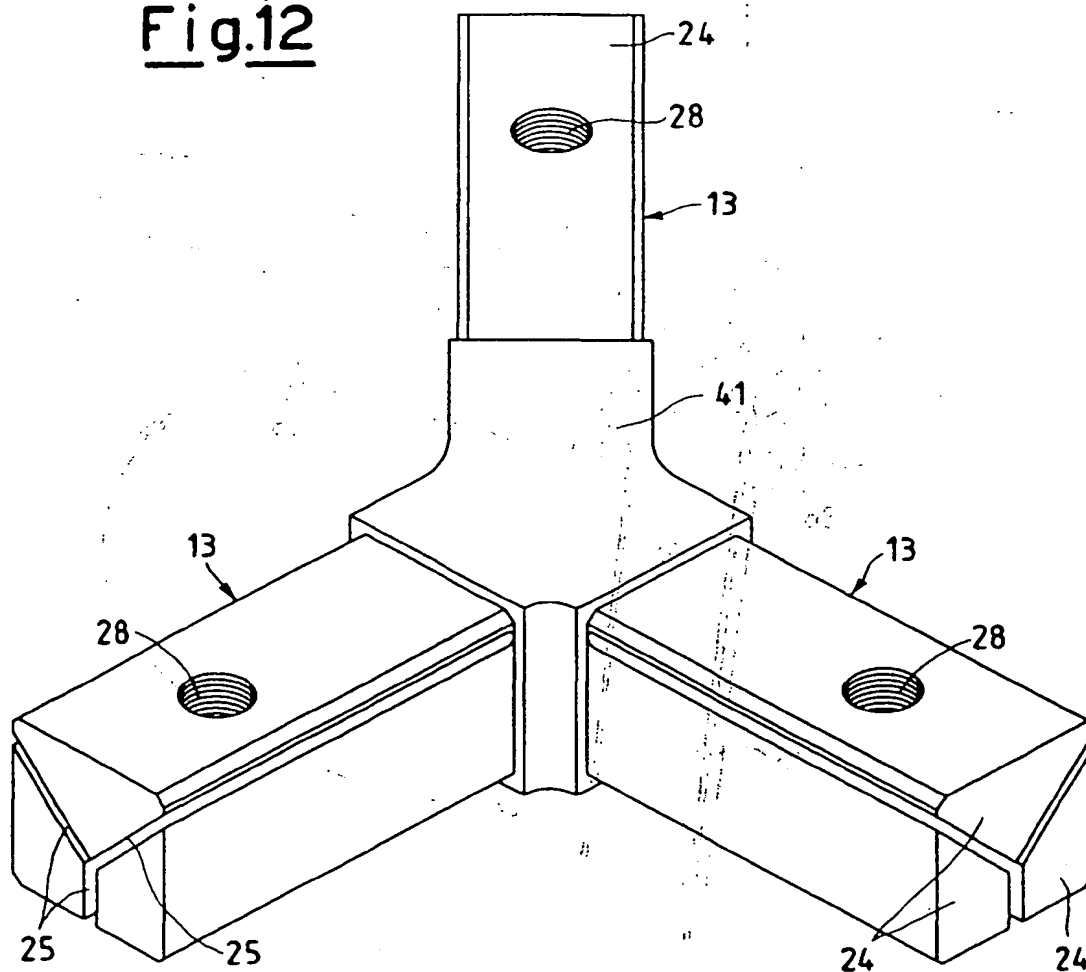


Fig.12



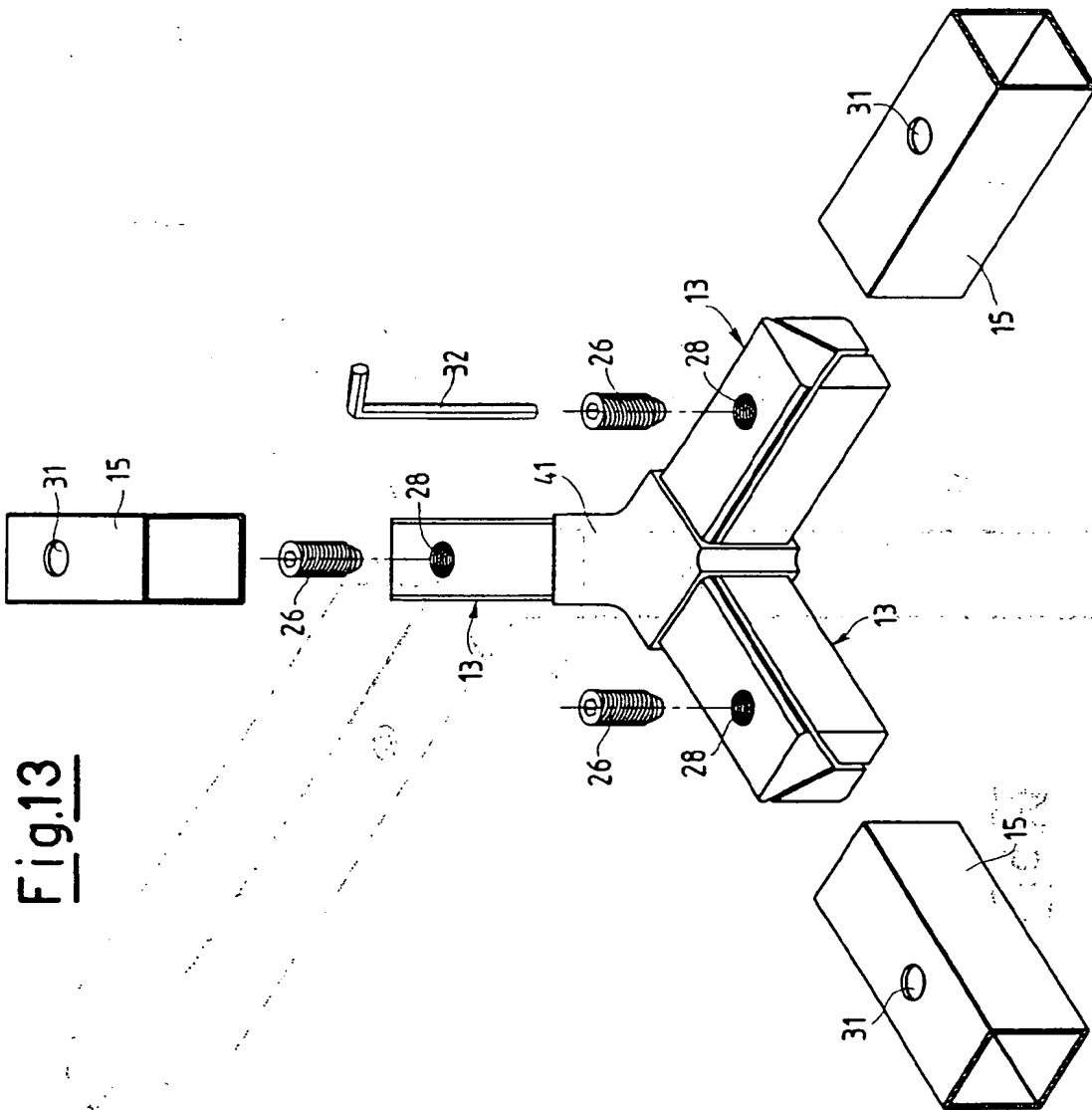


Fig.13

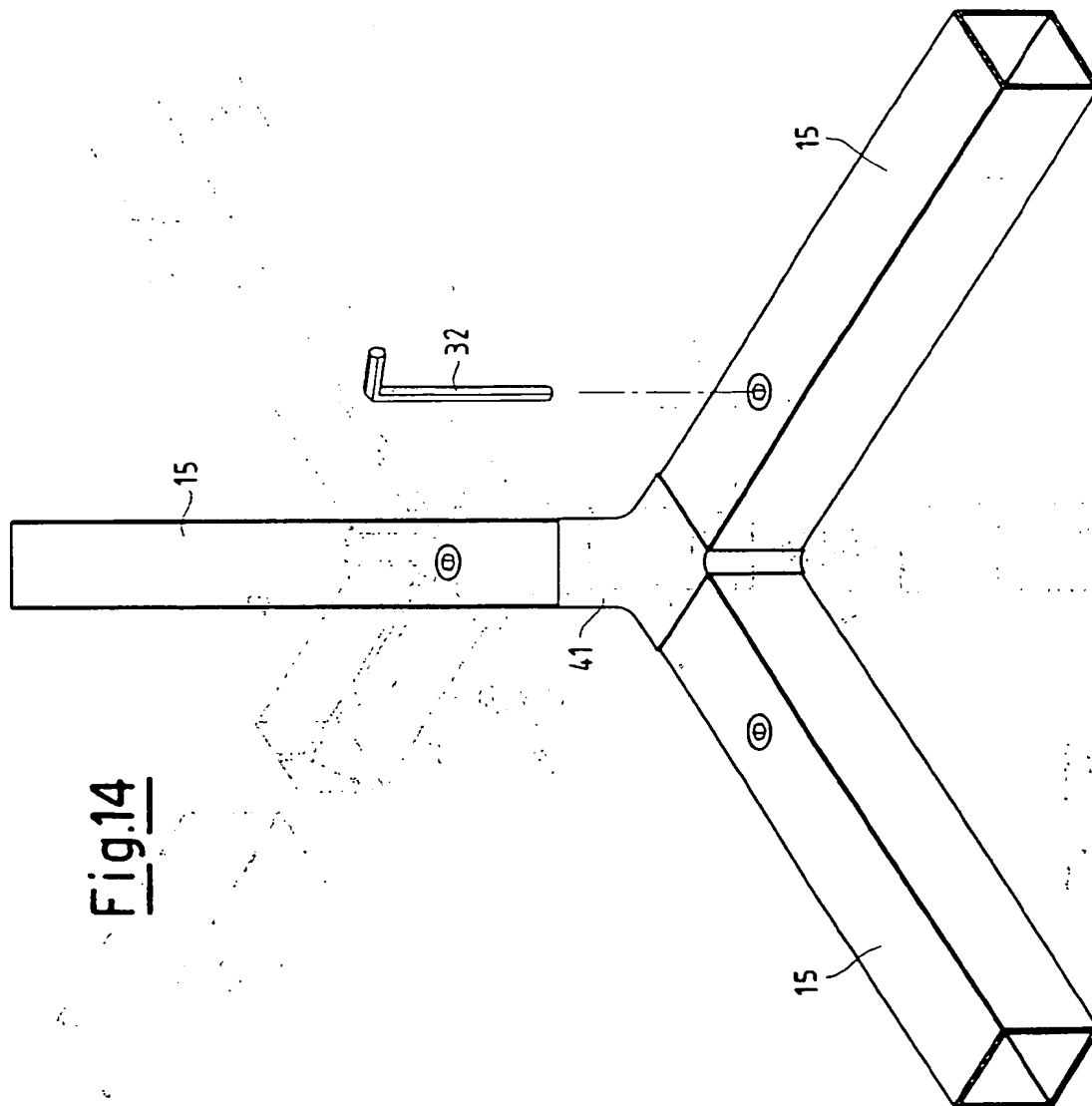


Fig. 14

Fig.15

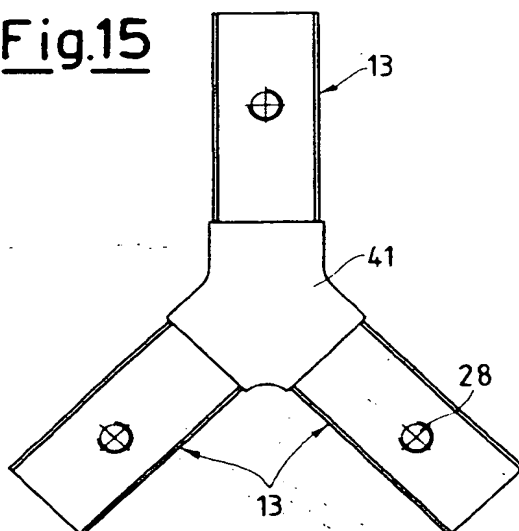


Fig.16

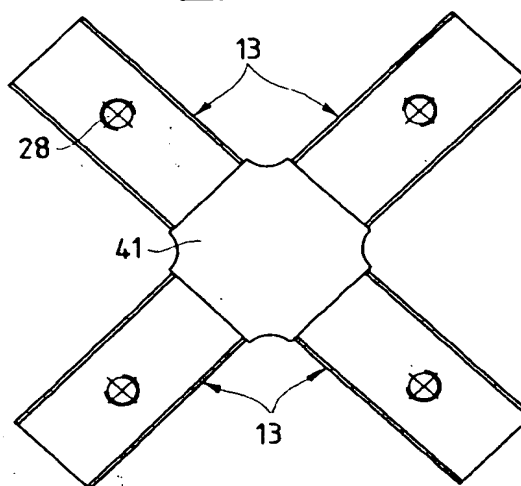


Fig.17

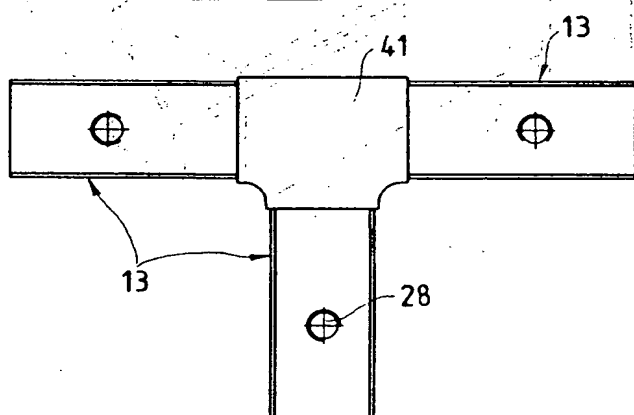


Fig.18

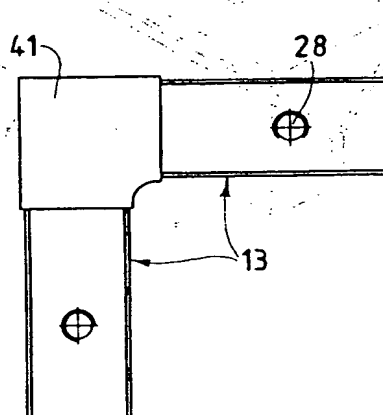
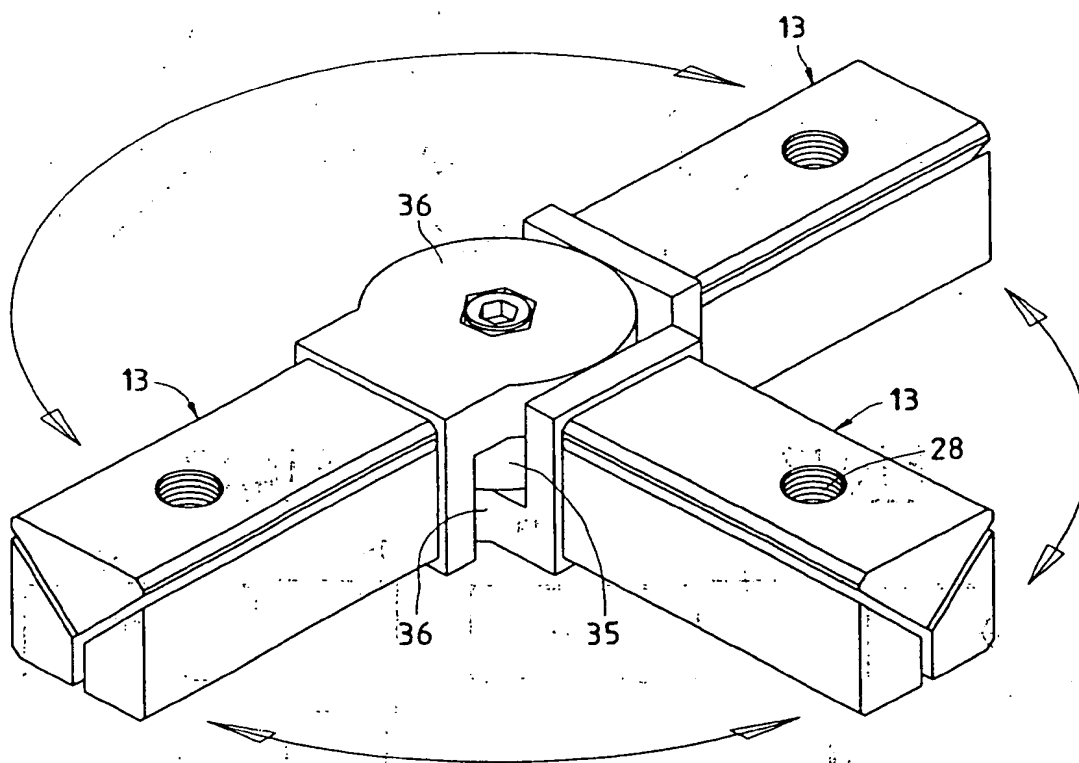


Fig.19



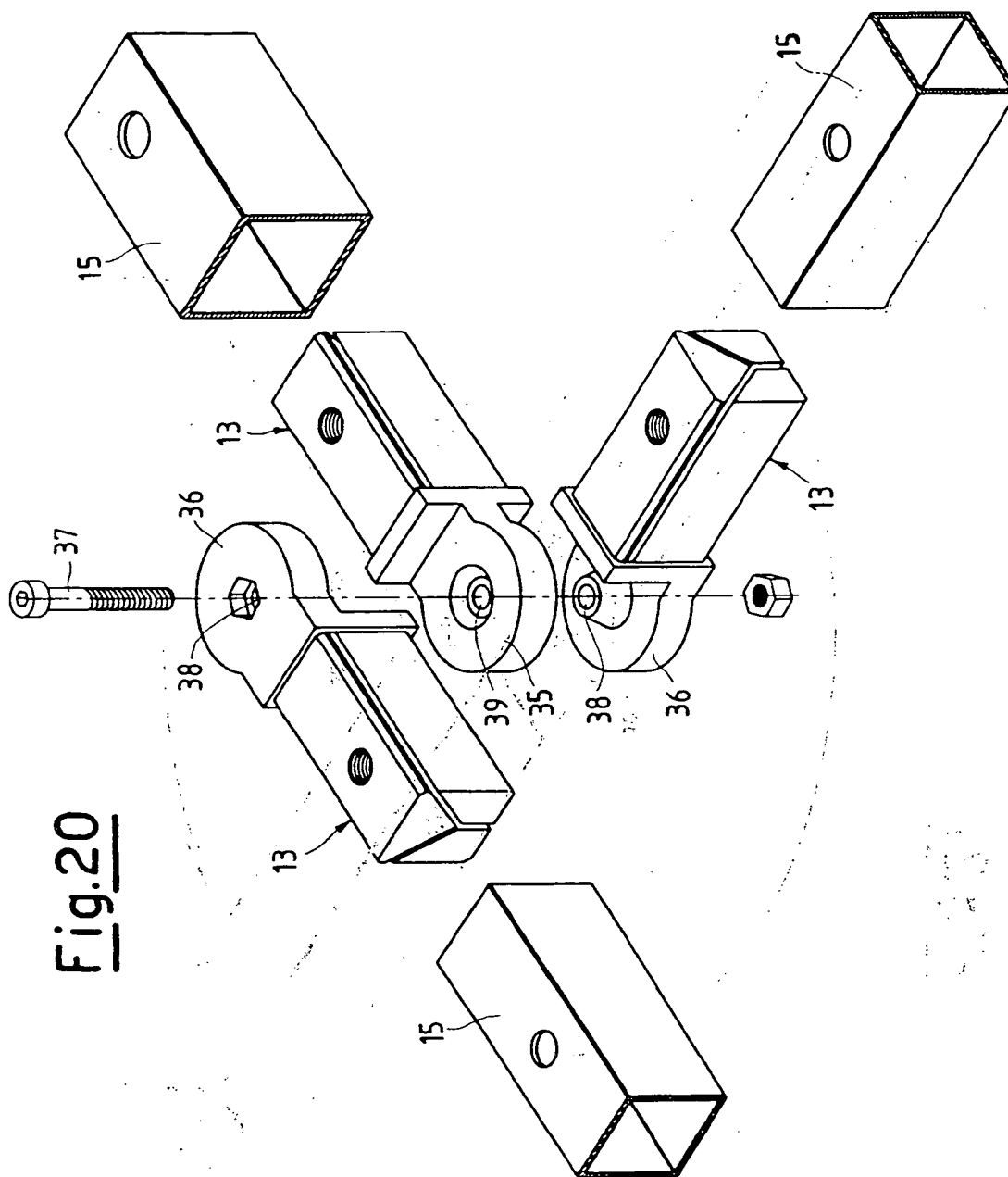
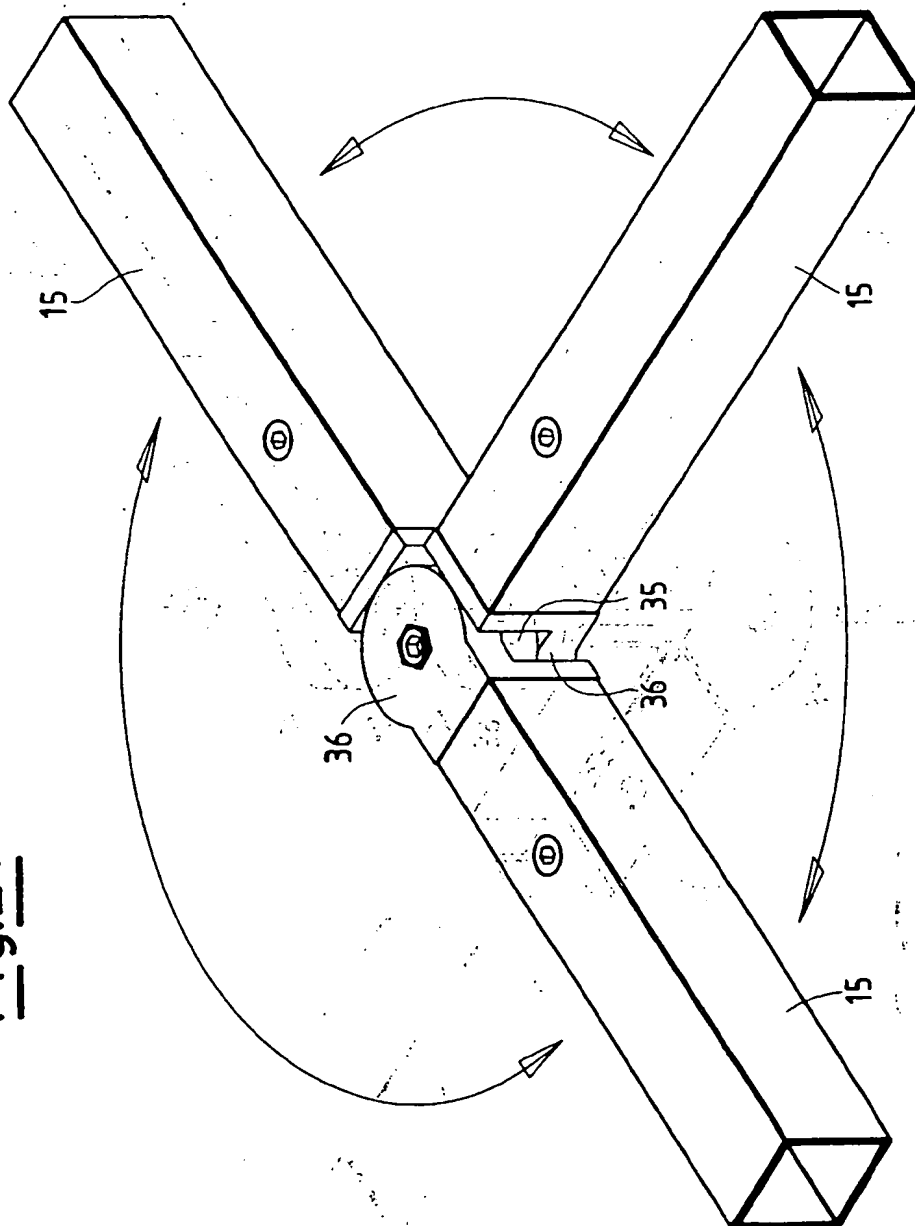


Fig.20

Fig.21



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## EUROPEAN SEARCH REPORT

Application Number

EP 97 20 3544

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	US 3 638 803 A (MACMILLAN) * the whole document *	1,4,5 2,3	A47B13/02 A47B47/00
A	GB 2 290 955 A (BOLLEN) * the whole document *	1,6,7,9	
P,A	EP 0 783 853 A (STEELCASE STRAFOR) * figures 1-8 *	1,8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 March 1998	Noesen, R

## CATEGORY OF CITED DOCUMENTS

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